

Xiurui Zhao

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Research Interests

High Energy Process of Active Galactic Nuclei and Supermassive Black Holes

Appointments & Fellowships

University of Illinois Urbana-Champaign, Urbana, U.S.	2023-
Post-Doctoral Research Fellow, advisor: Prof. Yue Shen	
Center for Astrophysics Harvard & Smithsonian, Cambridge, U.S.	2021-2023
Post-Doctoral Research Fellow, advisor: Dr. Francesca Civano, Dr. Martin Elvis	
Center for Astrophysics Harvard & Smithsonian, Cambridge, U.S.	2020-2021
Pre-Doctoral Fellow, advisor: Dr. Francesca Civano	

Education

Clemson University, Clemson, U.S.	2016-2021
Ph.D. in Astrophysics, advisor: Prof. Marco Ajello	
Dissertation: <i>Heavily Obscured Active Galactic Nuclei in NuSTAR Era</i>	
Lanzhou University, Lanzhou, China	2012-2016
B.Sc. in Physics, Cuiying Honors College	

Honors and Awards

Clemson University Outstanding Graduate Researcher Award (2 winners each year)	2021
Clemson Science College Outstanding Graduate in Discovery Award	2021
Clemson Physics Department Graduate Research Assistant Award	2021
SAO Predoctoral Fellowship	2020-2021
Clemson Graduate Student Travel Grant	2019, 2021
Cuiying Honors College Abroad Study Fellowship	2014, 2015

Accepted Scientific Proposals as PI

16 accepted X-ray/optical/sub-mm proposals with **\$370k** grant as PI.

- **X-ray (1.6 Ms)**

- **NuSTAR Cycle 9 (Large, 500 ks NuSTAR + 142 ks XMM, \$130k)** **2023**
“Systematically Constraining the AGN Coronal Properties with NuSTAR Using a Sample of Luminous, High-redshift Quasars”

- **NuSTAR** Cycle 8 (**Large**, 600 ks *NuSTAR* + 195 ks XMM, \$150k) **2022**
“Constraining the Properties of AGN Coronae using a Sample of Luminous, High-redshift Quasars with NuSTAR”
- **Swift**-XRT Cycle 19 (18 ks) **2022**
“Building with Swift/XRT a Sample of Luminous, High-redshift Quasars to Constrain the Properties of AGN Coronae”
- **NuSTAR** Cycle 8 (100 ks *NuSTAR* + 60 ks XMM, \$90k) **2021**
“Unveiling with NuSTAR the most powerful, heavily obscured, quasar ever discovered in X-rays”
- **Swift**-XRT ToO (3 ks) **2021**
“Measure the X-ray flux of a rare coronal line event quasar exhibiting another optical flare”
- **Optical (5.5 nights)**
- **MMT** 6.5m Hectospec (0.3+0.3 night, 335 sources) **2023A & 2022B**
“Complete the Hectospec Spectroscopic Survey of JWST NEP Time-Domain-Field”
- **MMT** 6.5m Binospec (0.1+0.1+0.1 night) **2023A & 2022B & 2022A**
Monitoring a Coronal Line Event AGN
- **MMT** 6.5m Binospec (0.4 night) **2023A**
Identify X-ray Bright Quasars and Constrain the AGN Coronal
- **SAO FLWO** 1.5m FAST (0.2 night) **2023A**
Measure the Black Hole Mass of an X-ray Bright Quasar to Constrain Its Coronal Properties
- **SAO FLWO** 1.2m Keplercam (1+1+2 night, g, r, i) **2023A & 2022B & 2022A**
“Monitoring the Continuous Optical Flares of a Coronal Line Event”
- **Sub-mm (3 tracks)**
- **Submillimeter Array** (SMA) standard science observation (3 tracks) **2022B**
“Monitoring with SMA a Highly Variable Flat Spectrum Radio Quasar in the JWST North Ecliptic Pole Time-Domain Field”

Collaboration & Professional Service

- Core Member of *HEX-P* Black Hole Growth & Corona Working Group **2022-**
- Member of *JWST* PEARLS Working Group **2022-**
- Member of *AXIS* AGN & TDA Science Working Group **2022-**
- Member of *NuSTAR* Extragalactic Survey Team **2020-**
- Member of *Athena* Science Working Group **2020-**
- + Panelist for NASA *NuSTAR* Proposal Review **2022-**
- + Reviewer for CFHT **2022A,B**
- + Reviewer for ApJ, A&A **2020-**
- Co-organizers of CfA High Energy Astrophysics Division Seminar **2021-2023**

Mentoring & Assistant Experience

Co-supervision of Clemson graduate student R. Silver	2019-
Co-supervision of Clemson graduate student A. Pizzetti	2019-
Co-supervision of Clemson undergraduate students D. Cole and Z. Hu	2019
Research Assistant, Clemson	2018-2020
Teaching Assistant (PHYS 2230), Clemson	2016-2017

Invited Talks

Caltech, Tea Talk	Feb 2024
Zhejiang University, Colloquium	Sep 2023
Peking University, KIAA-DoA Seminar	Aug 2023
Tsinghua University, Departmental Seminar	Aug 2023
University of Illinois Urbana-Champaign, local group meeting	May 2023
Yale University, Galaxy Lunch Talk	Apr 2023
MIT, Brown Bag Lunch Talk	Apr 2023
NASA GSFC, X-ray Astrophysics Laboratory AGN Seminar (Virtual)	Feb 2023
Center for Astrophysics Harvard & Smithsonian, High Energy Seminar	Feb 2023
Arizona State University, Cosmology Seminar	Dec 2022
University of Arizona, Steward Observatory / NOIRLab Galaxy group seminar	Dec 2022
MIT, High Energy Astro Group seminar (Virtual)	Apr 2022
Clemson University, Local Group seminar	Apr 2022
INAF OAS, Bologna, X-ray group seminar	Sep 2019

Conferences & Contributed Talks

243nd AAS Meeting (<i>Contributed Talk</i>)	New Orleans, Jan 2024
High Energy Astrophysics Division 20th Meeting (<i>Contributed Talk</i>)	Waikōloa, Mar 2023
241st AAS Meeting (<i>Contributed Talk</i>)	Seattle, Jan 2023
NuSTAR 2022 Conference (<i>Contributed Talk</i>)	Italy, June 2022
New England Regional Quasar and AGN Meeting (<i>Contributed Talk</i>)	Storrs, May 2022
High Energy Astrophysics Division 19th Meeting (<i>Poster</i>)	Pittsburgh, Mar 2022
Black Hole Across Space and Time (<i>Contributed Talk</i>)	Virtual, Dec 2021
238th AAS Meeting (<i>Dissertation Talk</i>)	Virtual, June 2021
237th AAS Meeting (<i>Contributed Talk</i>)	Virtual, Jan 2021
Supermassive Black Holes Meeting (<i>Contributed Talk</i>)	Virtual, Dec 2020
235th AAS Meeting (<i>Contributed Talk</i>)	Honolulu, Jan 2020
X-ray Astronomy 2019 Meeting (<i>Poster</i>)	Bologna, Italy, Sep 2019
High Energy Astrophysics Division 17th Meeting (<i>Poster</i>)	Monterey, Mar 2019
233rd AAS Meeting (<i>Contributed Talk</i>)	Seattle, Jan 2019

Workshops & Schools

CSST summer school at Peking University	Beijing, China, July 2023
Summer School for Astrostatistics at Penn State	State College, Jun 2023
End-to-end Simulations with SIXTE Workshop	Virtual, Mar 2022
2022 Submillimeter Array Interferometry School	Virtual, Jan 2022
Winter School at University of Freiburg	Freiburg, Germany, Feb 2015
Summer School at University of California, Berkeley	Berkeley, Jun-July 2014

Press Release

Webb Glimpses Field of Extragalactic PEARLS, Studded With Galactic Diamonds **2022**

Outreach & DEI

- † Volunteer to teach astronomy and mathematics to elemental and high school students in the rural area Qiajia, **Summer, 2023**
- † Translate Sensing Dynamic Universe project into foreign language (help people with visual disability accessible to the dynamic Universe with sonified light curves and spectra) **2022-2023**

References

- **Prof. Marco Ajello**
PhD advisor, Clemson University, majello@g.clemson.edu
- **Dr. Francesca Civano**
Postdoc advisor, NASA Goddard Space Flight Center, francesca.m.civano@nasa.gov
- **Dr. Martin Elvis**
Postdoc co-advisor, Center for Astrophysics | Harvard & Smithsonian, melvis@cfa.harvard.edu
- **Dr. Stefano Marchesi**
PhD co-advisor, INAF OAS, Bologna, stefano.marchesi@inaf.it

Updated: 11/11/2023

Publication List

A total of **25** peer-reviewed papers [ADS](#)

- **First-author papers**

- 6) **X. Zhao**, F. Civano, et al., to be submitted to MNRAS
The NuSTAR and XMM-Newton extragalactic surveys of the JWST North Ecliptic pole Time-Domain Field II
- 5) **X. Zhao**, F. Civano, F. M. Fornasini, et al. 2021, MNRAS, 508, 5176
The NuSTAR extragalactic surveys of the JWST North Ecliptic pole Time-Domain Field
- 4) **X. Zhao**, S. Marchesi, M. Ajello, et al. 2021, A&A, 650, A57
The properties of the AGN torus as revealed from a set of unbiased NuSTAR observations
- 3) **X. Zhao**, S. Marchesi, M. Ajello, et al. 2020, ApJ, 894, 71
A broadband X-ray study of a sample of AGNs with [OIII] measured inclinations
- 2) **X. Zhao**, S. Marchesi, M. Ajello, 2019, ApJ, 871, 182
Compton-thick AGN in the NuSTAR Era. IV. A Deep NuSTAR and XMM-Newton View of the Candidate Compton-thick AGN in ESO 116-G018
- 1) **X. Zhao**, S. Marchesi, M. Ajello, et al. 2019, ApJ, 870, 60
Compton-thick AGNs in the NuSTAR Era. II. A Deep NuSTAR and XMM-Newton View of the Candidate Compton-thick AGN in NGC 1358

- **Second/Third author**

- 10) F. Civano, **X. Zhao**, P. Boorman, et al., Submitted to Front. Astron. Space Sci.
The High Energy X-ray Probe (HEX-P): Bringing the Cosmic X-ray Background into focus
- 9) E. Kammoun, et al. (including **X. Zhao**), Submitted to Front. Astron. Space Sci.
The High Energy X-ray Probe (HEX-P): Probing the physics of X-ray corona in active galactic nuclei
- 8) N. Torres-Albà, M. Stefano, **X. Zhao**, et al., A&A, 678, A154
Hydrogen Column Density Variability in a sample of local Compton-thin AGN
- 7) R. Silver, N. Torres-Albà, **X. Zhao**, et al., 2023, A&A, 675, A65
A New Mid-Infrared and X-ray Machine Learning Algorithm to Discover Compton-thick AGN
- 6) R. Silver, N. Torres-Albà, **X. Zhao**, et al. 2022, ApJ, 940, 148
Compton-thick AGN in NuSTAR Era. IX: joint NuSTAR and XMM-Newton analysis of four local AGN
- 5) S. Marchesi, **X. Zhao**, N. Torres-Albà, et al. 2022, ApJ, 935, 114
Compton-Thick AGN in the NuSTAR era VIII: A joint NuSTAR-XMM-Newton monitoring of the changing-look Compton-thick AGN NGC 1358
- 4) R. Silver, N. Torres-Albà, **X. Zhao**, et al. 2022, ApJ, 932, 43
Chandra Follow-up Observations of Swift-BAT-selected AGNs II
- 3) N. Torres-Albà, S. Marchesi, **X. Zhao**, et al. 2021, ApJ, 922, 252
Compton-thick AGN in NuSTAR Era VI: The Observed Compton-thick Fraction in the Local Universe
- 2) S. Marchesi, M. Ajello, **X. Zhao**, et al. 2019, ApJ, 882, 162
Compton-thick AGNs in the NuSTAR Era. V. Joint NuSTAR and XMM-Newton Spectral Analysis of Three "Soft-gamma" Candidate CT-AGNs in the Swift/BAT 100-month Catalog

- 1) S. Marchesi, M. Ajello, **X. Zhao**, et al. 2019, ApJ, 872, 8
Compton-thick AGNs in the NuSTAR Era. III. A Systematic Study of the Torus Covering Factor

- **Co-author papers**

- 10) P. Boorman, et al. (including **X. Zhao**), Submitted to Front. Astron. Space Sci.
The High Energy X-ray Probe (HEX-P): Probing the circum-nuclear environment in AGN down to extremely low luminosities
- 9) N. S. Khatiya, et al. (including **X. Zhao**), Submitted to ApJ
Characterizing the γ -ray Emission from FR0 Radio Galaxies
- 8) I. Cox, et al. (including **X. Zhao**), ApJ, in press
A simple method to predict N_H variability in active galactic nuclei
- 7) S. P. Willner, et al. (including **X. Zhao**), ApJ, in press
PEARLS: JWST counterparts of micro-Jy radio sources in the Time Domain field
- 6) C. N. A. Willmer, et al. (including **X. Zhao**), ApJS, in press
PEARLS: Near Infrared Photometry in the JWST North Ecliptic Pole Time Domain Field
- 5) Q. Yang, et al. (including **X. Zhao**), 2023, ApJ, 953, 61
Probing the Origin of Changing-look Quasar Transitions with Chandra
- 4) D. Sengupta, et al. (including **X. Zhao**), 2023, A&A, 676, A103
Compton-thick AGN in the NuSTAR Era IX: Analysis of seven local CT-AGN candidates
- 3) R. A. Windhorst, et al. (including **X. Zhao**), 2023, AJ, 165, 13
Webb's PEARLS: Prime Extragalactic Areas for Reionization and Lensing Science: Project Overview and First Results
- 2) A. Pizzetti, et al. (including **X. Zhao**), 2022, ApJ, 936, 149
A multi-epoch X-ray study of the nearby Seyfert 2 galaxy NGC 7479: Linking column density variability to the torus geometry
- 1) A. Traina, et al. (including **X. Zhao**), 2021, ApJ, 922, 159
Compton-Thick AGN in the NuSTAR era VII: a joint NuSTAR, Chandra and XMM-Newton analysis of two nearby, heavily obscured sources